

Winter Weather WES Case Scenario: 31 January - 1 February 2008

Simulation 2: St. Louis, MO County Warning Area Winter Weather Warning/Advisory Phase

This simulation focuses on the challenge of recognizing the scope of the heavy snow potential in the St. Louis, MO (LSX) County Warning Area (CWA). You are working a midnight shift at WFO St. Louis, MO and the start time for this simulation is 0500 UTC 31 January 2008. Previous shifts have recognized that there is considerable agreement that a major winter storm would affect at least a portion of the LSX CWA. A winter storm watch has been issued for the entire CWA. However, between the deterministic models, uncertainty existed in the track of the mass fields and QPF. Your job is to determine if you would like to issue a Winter Storm Warning or Advisory for all or portions of the LSX CWA for the event.

Simulation 2 will focus on forecasting heavy winter precipitation with respect to both synoptic and mesoscale forcing.

The simulation should take about a hour to complete.

(30 min): Deterministic model analysis - Ingredients based methodology for forecasting heavy precipitation.

(15 min): Mesoscale diagnosis: TROWAL.

(5 min): HPC internal winter weather product review.

(10 min): Issue winter weather products.

(30 min): Deterministic model analysis - Ingredients based methodology for forecasting heavy precipitation.

For more information on the ingredients based methodology for forecasting heavy precipitation, see IC Winter Lesson 6.4

For simulation 2, please set the simulation time to 0500 UTC 31 January 2008. After a thorough analysis of the deterministic model guidance, please answer the following questions.

1. Load the NAM40 850mb HGHT and 500mb HGHT and observe the track of the 850mb low with respect to the upper-level troughs between 1200 UTC 31 January 2008 and 1800 UTC 1 February 2008. Given the evolution of the synoptic pattern, would this pattern be favorable for warning criteria snowfall in the LSX CWA? Explain why (reference the Goree/Younkin/Browne Technique).

LSX CWA Winter Storm Warning Criteria: Issued for snow events of 6 inches or more, sleet accumulations of 1/2 inch or more, or a combination of winter precipitation which will create life threatening conditions.

2a. Utilizing model soundings, what will be the primary precipitation type across the LSX CWA between 1200 UTC 31 January and 1800 UTC 1 February 2008?

2b. Where does the NAM40 forecast the heaviest precipitation for the LSX CWA between 0000 and 1200 UTC 1 February 2008?

3. Load the cross section procedure `Winter_X_Section` (which was provided to your SOO) from northwest Iowa to northeast Alabama. On 0000 UTC 1 February 2008, where is the strongest lift forecast? What are the primary forcing mechanisms that are responsible for the strong omega across the LSX CWA?

(15 min): Mesoscale diagnosis: TROWAL.

For more information on the TROWAL, see IC Winter Lesson 5.5

4. Load the NAM40 295K isentropic surface of pressure (load as image and contours) and wind, 600-500mb saturated equivalent potential vorticity (EPV), 700mb QG frontogenesis, and 0-5 km AGL MUCAPE (set density to maximum).

a. After analyzing the pressure and wind on the 295K between 0000 and 1200 UTC 1 February 2008, approximately where will the TROWAL axis reside at 0900 UTC?

b. After analyzing the 700mb QG frontogenesis and 600-500mb layered saturated EPV between 0000 and 1200 UTC 1 February 2008, would you expect mesoscale banding within the main deformation snow shield? Given the location of maximum frontogenesis, where would you expect the most intense lift to be located at 0900 UTC?

c. After analyzing the 700mb QG frontogenesis and 0-5 km AGL MUCAPE between 0000 and 1200 UTC 1 February 2008, would you anticipate upright or slantwise convection?

d. Do the findings in 5a through 5c support the location and intensity of the NAM40 precipitation forecast in the LSX CWA between 0000 and 1200 UTC 1 February 2008?

(5 min): HPC internal winter weather product review.

5. HPC Winter Weather Desk deterministic snow forecasts have just been issued (Fig. 1). What are the major differences between the current and previous HPC deterministic snow forecast for WFO LSX?

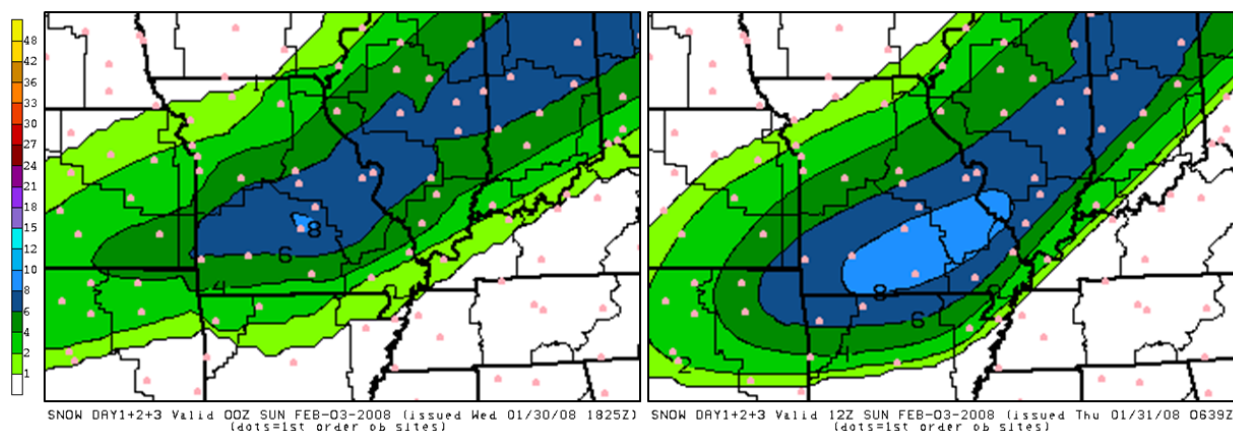


Fig. 1. HPC Winter Weather Desk deterministic forecasts issued at 1825 UTC 30 January 2008 (left) and 0639 UTC 31 January 2008 (right).

6. Using the guidance that was presented in this simulation, should all or a portion of the LSX CWA be included within a winter storm warning or advisory? Use the LSX CWA map (Fig. 2) to shade the counties to be included in the warning or advisory.

Winter Weather Advisory: Issued for average snowfall of 3 to 5 inches, sleet accumulation of less than 1/2 inch, or a combination of winter precipitation which will produce hazardous conditions. At forecaster discretion, an advisory can be issued for lesser amounts of snowfall if the timing of the event creates hazardous conditions.

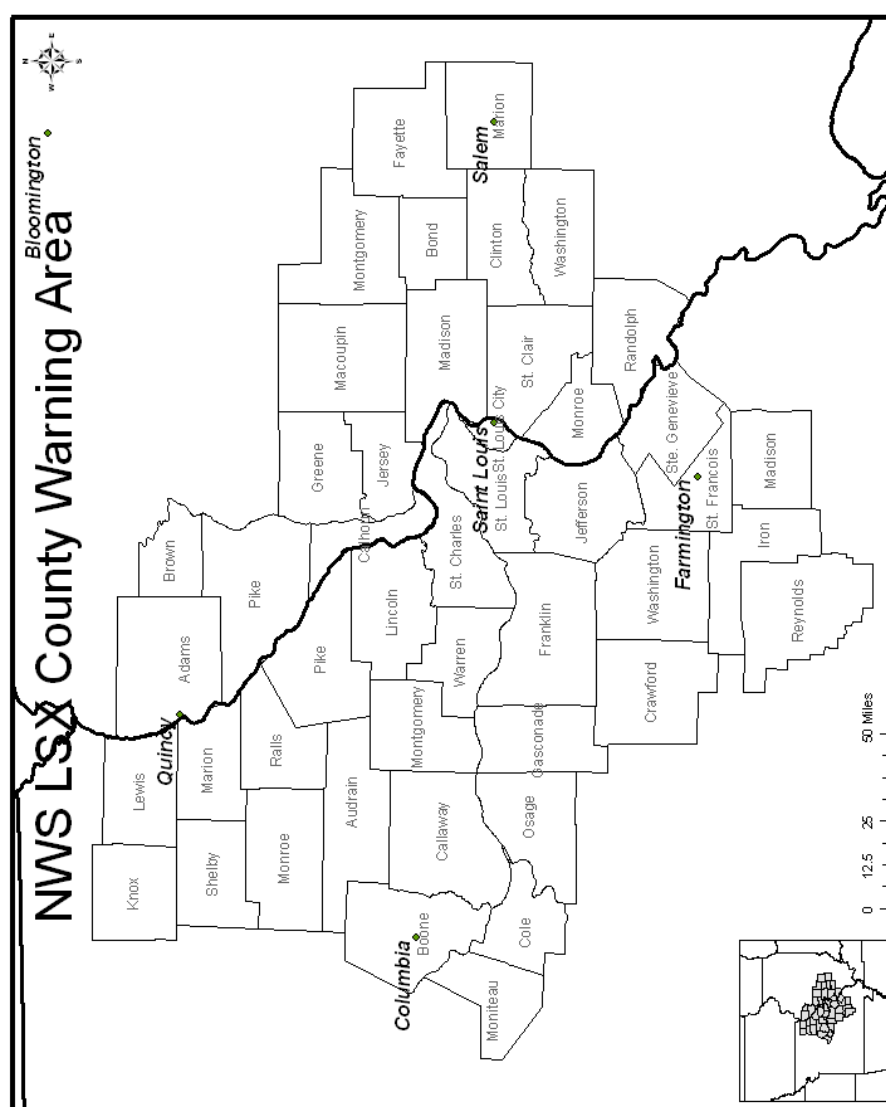


Fig. 2. St. Louis, MO (LSX) CWA county warning map.